

Low Light Operations

First things first, **all long guns used by Law Enforcement should be equipped with a mounted light system so that a suspect may be properly identified and accurately engaged.** General area searching can be conducted with a separate hand-held light by a rifle-armed officer, but specific searching or movement-to-contact while negotiating barriers, such as doors, will be safer and more efficient with a rifle-mounted light.

INSTRUCTOR NOTE: As with all weapon mounted light systems, the officer should consider the weapon mounted light to be a “shooting/kill” light while his hand-held flashlight should be used as a “searching” light. Most circumstances would require a search be conducted with a NON weapon-mounted light to avoid violating Basic Safety Rule #2 – Never point the weapon at anyone you have not decided to shoot. However, when a “general” search for a dangerous suspect becomes more narrowly focused and contact seems imminent, transitioning to the rifle mounted light is appropriate as it takes both hands to efficiently operate the patrol rifle. The proper use of the manual safety will help mitigate the chance of any unintentional discharges during these stressful contacts.

Prior to investing in the equipment, consideration should be given to what is the purpose of the flashlight in regards to potential confrontations. Some things to consider:

1. To enable the officer to **Locate and Identify** the threat(s). Location is only one step in solving the tactical problem. The flashlight must be of sufficient brightness to allow the officer to readily identify any object in the hand of those encountered to determine subsequent appropriate action.
2. A good light source should be of sufficient candlepower or lumens to give the officer the tactical advantage of **Blinding and Disorienting** (even momentarily) their opponent.
3. The use of a good light source allows the **iron sights** of the officer's rifle (if that is all the weapon is equipped with) to be boldly **silhouetted** against the backdrop of the illuminated threat area. This allows reasonable sight picture under adverse lighting conditions whether or not the weapon is equipped with a luminous “night sight.” Night sights are fairly useless on a patrol rifle for if it is dark enough to see the tritium vials then it is usually impossible to identify a suspect and recognize a threat. If a rifle light is used is turned on, then the glow from the tritium is washed out by the white light and you see the silhouette of the iron sights without the tritium glow. Spend your money on a rifle-light instead of night sights.
4. To enable the officer to **Navigate** in adverse lighting conditions. Sufficient artificial light introduced to the environment can eliminate tripping over unseen hazards that could cause injury or cancel out noise discipline. Some of the modular rifle lights, such as the Sure-Fire M500A and M900A, incorporate one or two very small low-intensity LED lights of various colors to be used as “navigation” lights instead of triggering the high-intensity light.



Sure-Fire M500A Light integrated into the handguard



Sure-Fire M900A Light and fore-grip clamps onto a Picatinny rail.

In an age of rapidly changing technology, firearms instructors not only must give serious consideration to the initial rifle light purchase but also be constantly reassessing new products. Weapon light technology is changing rapidly due to demand from the current global war on

terror. Lights are getting smaller, brighter, and more durable while battery life is getting longer thanks to the emergence of LED (Light Emitting Diode) bulbs and it is important that you understand the differences between LEDs and incandescent bulbs.

The first commercially successful incandescent bulb was invented by Thomas Edison more than 100 years ago and they are still pretty much the same today. A thin metal wire “filament” is heated by electricity until it glows white hot as it produces bright light from the **red portion of the light spectrum**, the same as light from the sun. This heated filament may break when subjected to any kind of shock or impact which makes them less than durable for LE use. Low-intensity LEDs were introduced in the early 1960s and only recently have been developed into high-intensity lights producing bright light from the **blue portion of the light spectrum**. LEDs produce more light per watt of power, are not affected by impact or shock, and seem to never burn out; seemingly perfect characteristics for a weapon light. The human eye “sees” better with the “yellowish” light from the red spectrum incandescent bulbs, and it takes more of the “whitish” blue spectrum light of LEDs to be able to see as well. However, LEDs penetrate tinted vehicle windows better than incandescent lights do as the tint is designed to screen out the red spectrum light of the sun, and LEDs seem to penetrate better in smoke and fog better as well.

If we compare two similar 6-volt (2) 123A cell Sure-Fire lights, like the incandescent 6P and the 6P LED, which are used in many rifle-light systems, we have lots of options to consider when making a department purchase. Cost of the 6P is \$62.00 while the LED runs \$89.00; \$27.00 more for the LED. A 6P P-60/61 replacement lamp cost \$19.00 and you will need spares, while the LED lamp runs \$49.00 and you will probably never need one. The 6P produces 65 lumens for 1hr, and the LED generates 80 lumens for 3hrs. You can use a more powerful 105 lumen P-61 lamp in the 6P but your run time drops to only

20 minutes. You can replace the Sure-Fire 80 lumen LED with a 230 lumen/90 minute spot or flood lamp from Malkoff Devices at a cost of \$59.00; and Malkoff also has a 500 lumen lamp for \$125.00. A spot lamp gives you greater distance due to

a concentrated hot spot of light that usually draws the human eye to its center of the beam, sometimes causing the eye to ignore less intense peripheral or “spill” light which can be a hindrance while searching. The flood lamp gives a wider consistent beam without the distractions of a center hot spot and while this limits the long range use, it makes for a superior entry or building search light where the eye can more quickly scan a more widely illuminated area. If these two 6P lights were modified into a 9-volt (3) 123A cell system, the incandescent would become a 9P and require the different and more powerful P90/91 lamps that would produce 105 lumens for 1hr/200 lumens for 20 minutes, while the 9P LED would use the same LED lamps with the same lumens but with double the run time. Using the same LED lamp for both 6 & 9 volt systems is an obvious inventory advantage, using a P60 lamp in a 9-volt 9P will immediately blow the bulb and using a P90 lamp in a 6P produces no light at all. So analyze your mission, do the math, and make the right light choice for your agency.



Mounting a Rifle Light

There are several different options for mounting a light on a patrol rifle. The light integrated into the handguard and the light/foregrip are a couple of methods. Those mounting systems fix the light in a specific place and, as with many tactical equipment selections, there are some tradeoffs.

A light mounted on the right side of the weapon (say in the 3:00 position) may cause a shadow to be cast on the left side of the target. A light mounted in the 6:00 position can cast a shadow across the upper half of the target. Any shadowing should influence the use of Depressed Muzzle Theory which is the concept of not pointing our muzzle directly at people who we have not decided to shoot yet. Keep in mind that this concept does not require that the muzzle be kept low off of the target, only that the muzzle should not be pointed directly at it. Moving the rifle-mounted light up towards the hands or head height to make maximum use of the light is fine, just keep the muzzle off-target to the side. With a light mounted at 3:00 on the right side, casting a left shadow, then hold the muzzle slightly off to the left side of the target. Maximize the benefits of the light while minimizing the amount of muzzle time on target; that is the goal of the Depressed Muzzle Theory.

All other factors being equal having the light mounted as far forward as possible will cause the least amount of shadowing. Let's examine some Pros and Cons of a few popular mounting systems:

Mounted at the 6:00 position; SureFire 6P light with M-14 mount and a “clicky-cap” end piece.



This mounting position allows for left or right hand operation. An important consideration for “pool” rifles they may be used by several different officers.



The switch can be activated with either hand. A press of the tail cap turns the light on momentarily, or clicking the tail switch will allow the light to remain on without the officer needing to keep their hand on the button. This type of switch is also pretty safe from accidental or unintentional discharges of the light.

However, a light mounted in this position can cast a fairly large shadow on the target.

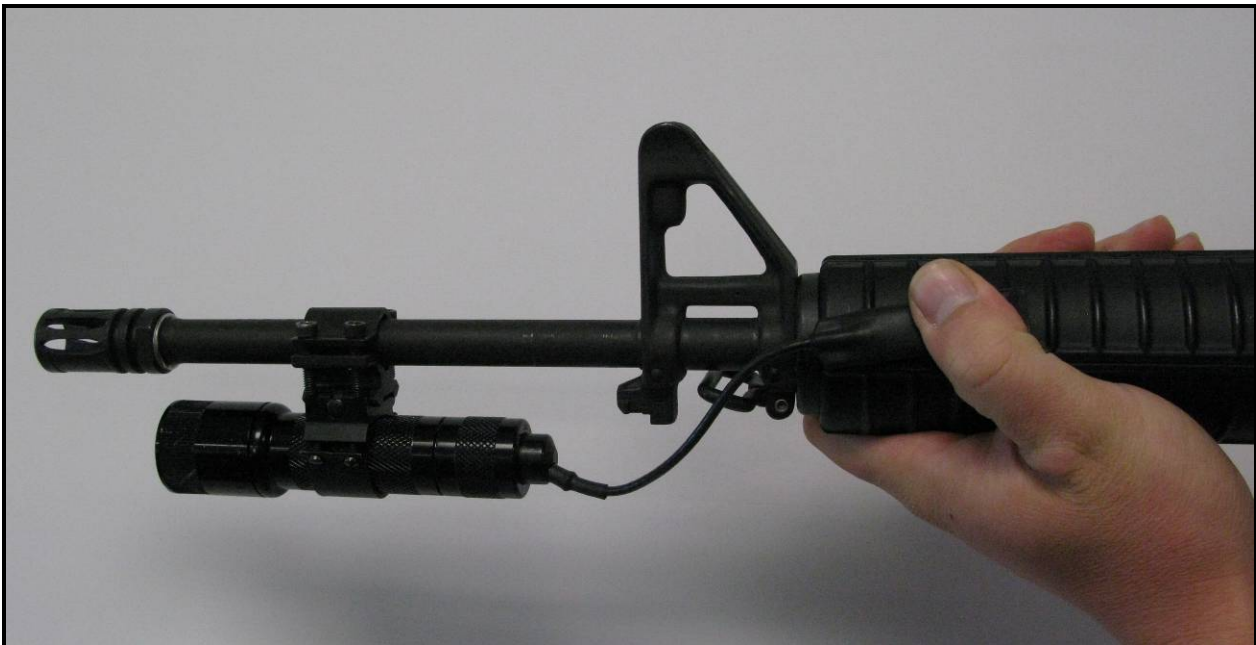


Does this suspect have a weapon?

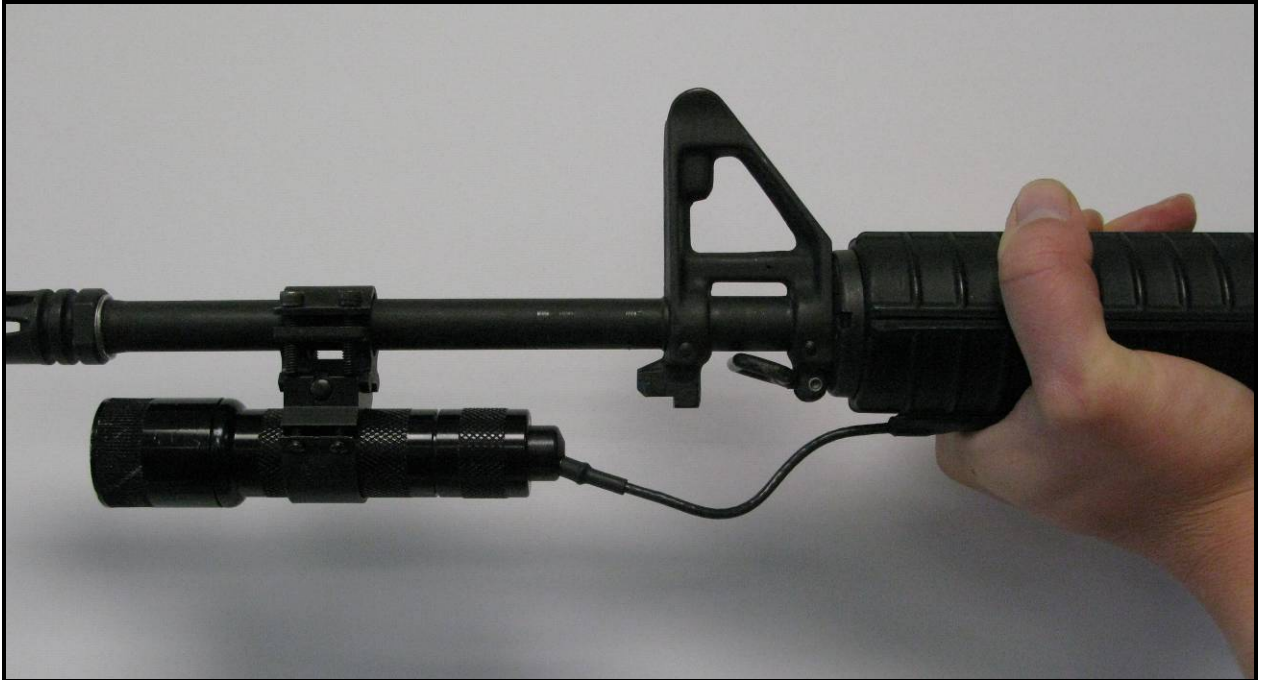


For an individually issued rifle the light can be mounted at the 9:00 position and operated with the shooter's thumb.

Another mounting option for a rifle light is a barrel clamp with a pressure sensitive pig-tail switch.



Here the pig-tail is located in the 9:00 position for a right handed shooter. Note: The pig-tail allows the light to be mounted farther forward. This will have less of a shadow on the upper torso of the suspect, but the weight of the light is farther forward and the pig-tail is more prone to unintentional discharges of the light.

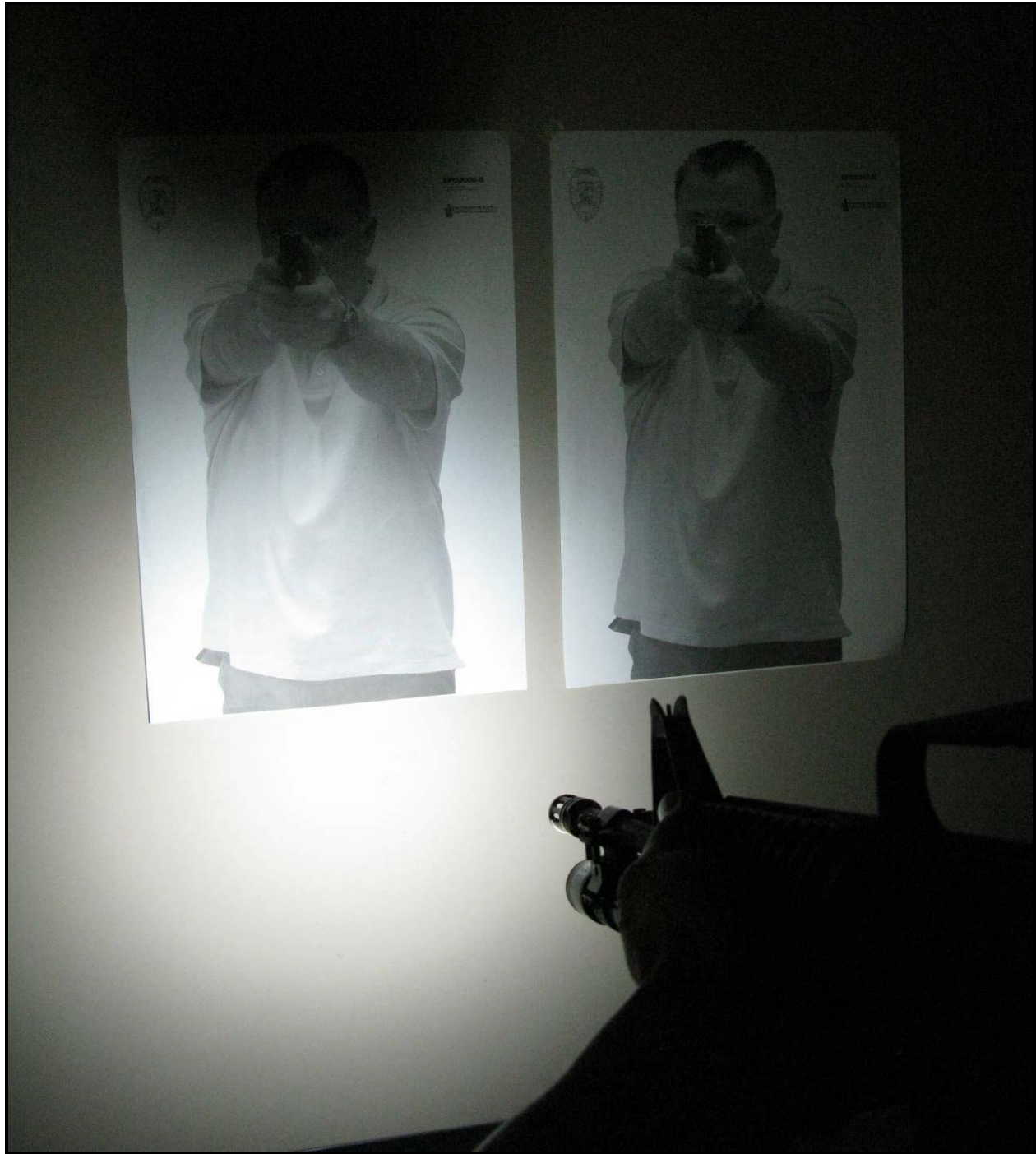


A 6:00 mounting position for the switch could be operated by a right or left handed shooter



Here the pig-tail is mounted in the 3:00 position. Most pig-tails are mounted with sticky backed hook & loop material.

A forward mounted rifle light



With the rifle light mounted farther forward the target directly in front is more completely illuminated, as is the other target off to the shooter's right.

The Picatinny Rail System



Sure-Fire 6P in Viking Tactical rail mount

The Picatinny rail system allows for the secure mounting of numerous different types of accessories.

A well manufactured and sufficiently powerful light placed in this position will give the patrol officer a definite advantage when engaging a suspect during low light conditions. The light is positioned to minimize any shadows that may have been cast by a 6:00 mounted light and the light should shine into the suspect's eyes; perhaps disabling the suspect when challenged by the officer and eliminating the need for the officer to shoot.



Light mount in the 11:00 position



Light mount in the 3:00 position

Adverse Lighting Conditions

Principles of searching and shooting under adverse lighting conditions

Understanding the fundamental concepts of searching and shooting in adverse lighting conditions is the key to successful outcomes. Prior to learning **techniques** it is imperative that law enforcement officers understand the basic **principles** that form the foundation for their actions.

Principle #1 Read the light

There are four categories of lighting conditions

1. Bright High Noon:
 - Well lit.
 - A high level of detail is visible.
 - Conditions allow for good depth perception.
 - Conditions for threat identification are excellent
2. Dawn and Dusk:
 - Can distinguish shapes, texture and colors and noticeable shadows.
 - Conditions for threat identification are impaired.
3. Low Full Moon:
 - There is ambient light source from street lights, residences etc.
 - Able to distinguish shapes.
 - Distance judgment is impaired
 - Conditions for threat identification are severely impaired.
4. No ambient light:
 - Complete darkness rarely encountered except in underground or windowless structures.
 - Ability to identify threat without artificial light source is non-existent.

Principle #2 Operate from the lowest level of light

1. Remember that predators operate from cover of darkness
2. Clear dark holes and shadows with light before entering or exposing yourself to them
3. Assume that all dark holes and shadows are occupied by armed assailants

Adverse Lighting Conditions

Principle #3 See from the opponent's perspective

1. Imagine yourself from the opponent's perspective.



2. Be cautious of silhouetting yourself against ambient light shining through windows, doorways, or the indirect light from fellow officer's flashlights.
3. Whenever possible, position yourself to require potential opponents to have to look into your darkened position.
4. Consider what the potential opponent can see and let that perspective determine your safe route of travel when the decision is made to move.
5. When working with other officers, be conscious of exposing their location by shining your flashlight directly or indirectly on them.
6. Be cautious of ambient light causing your shadow to proceed you into an unsecured area.

Adverse Lighting Conditions

When shooting or searching from cover

7. Move from cover and/or concealment only when safe to do so.
8. When using light from behind cover, be careful not to allow the beam of light to shine on the cover object being used to avoid reflection back into the face of the officer, revealing their location, preventing them from seeing their objective clearly, and impairing their night vision.
9. Rifle/Light mounting systems which locate the light to the side of the weapon will tend to partially or entirely block the beam from the flashlight when firing from one side or the other of the cover. Training with alternative techniques or shooting positions will provide the officer with flexibility needed to adapt to all contingencies.
10. Shooting positions which allow the officer to stand back from cover that work well in daylight may need to be adjusted to take reflection into account under adverse lighting conditions. **A rule of thumb is to ensure that the lens or bezel of the light is even with, or slightly forward of, the edge of the object being used for cover.**



Rifle light 3 feet back from interior wall and short hallway. Note backscatter of light and very little illumination into hallway

Adverse Lighting Conditions



Rifle light held even with same hallway. Note almost no backslash and the light now illuminates the target in the hallway.

INSTRUCTOR NOTE: It is recommended that officers take advantage of playing the part of “bad guy” role players in realistic scenario training to observe what techniques are effective.

Principle #4 Lights and move

1. When *searching and approaching* suspected threat areas, use the flashlight minimally, turning it off and on in short duration only as needed. Do not allow the steady beam of light to be used by the opponent as a beacon to point out your position.
2. Light then move. Avoid remaining stationary unless utilizing effective cover and then avoid reappearing with the light in the same position.
3. Whenever possible, when *actively engaging* a threat, use the light while shooting. Shut it off if movement is necessary and turn it on again to reengage from another position. If already in a position of advantage, consideration should be given to maintaining the advantage by keeping the light in their eyes.

Adverse Lighting Conditions

Principle #5 Power with light

1. Use the flashlight to eliminate all dark holes and shadows offering concealment to potential threats.
2. When possible create a wall of light to blind opponents. **Remembering Basic Safety Rule #2 Never point the weapon at anyone you do not intend to shoot.**

Principle #6 Keep three things aligned

1. When *actively confronting* a specific opponent in a known location, keep the weapon, the light and the eyes aligned to enable swift reaction to a threat.
2. Non specific searching with multiple potential danger locations may require separation of light and eyes from the direction the weapon is pointing such as when scanning.
3. The ability to swiftly and efficiently respond to a threat should be maintained throughout the searching process. The position of the officer's weapon, flashlight, and body must never compromise their ability to swiftly assume a balanced shooting platform should a sudden threat appear.

Principle #7 Carry more than one light

1. The primary light source may fail. Batteries, bulbs and switches may succumb to "Murphy's law."

INSTRUCTOR NOTE: Incandescent bulbs are fragile when hot and can be broken from shock such as dropping, bumping, recoil, etc. Consider upgrading to LED technology and you will eliminate most lamp failures.

2. The secondary light (much like the back-up handgun) should be of sufficient power to accomplish the tasks required of it. It should be carried in a location and manner making it readily accessible. Training must take place to address any differences in configuration and switch location from the primary flashlight.
3. It is imperative that a second flashlight is carried for use during searching. It must be remembered that everything that is seen in the **center** of the beam of the light mounted on the weapon will subsequently have the muzzle pointed at it, thereby violating Safety Rule #2 The hand held light should be used for searching and the weapon mounted light should be considered as one solely intended for fighting.